

**WHAT IS CLAIMED IS:**

1. An internal combustion engine comprising:
  - a control system for closed-loop control of an engine function that is appropriate for fault monitoring;
  - a data source providing a desired data value for the function;
  - a data source providing an actual data value for the function;
  - an input data value to the control system derived from the desired and actual data values for the function;
  - a fault monitoring system for monitoring the input data value over a time interval comprising a timing function defining the time interval, an integration function that integrates the absolute value of the input data value during the time interval to provide an integrated data value, and a comparison function for comparing the integrated data value and a data value defining a fault.
2. An engine as set forth in Claim 1 wherein the fault monitoring system further comprises a latch function that operates to latched condition when the result of comparing the integrated data value and a data value defining a fault indicates that the integrated data value is greater than or equal to the data value defining a fault.
3. An engine as set forth in Claim 2 wherein the data value defining a fault is a programmable parameter of the engine control system.

4. An engine as set forth in Claim 1 wherein the fault monitoring system further comprises a reset function for resetting the fault monitoring system upon expiration of the time interval.

5. An engine as set forth in Claim 1 wherein the time interval is a programmable parameter of the control system.

6. An engine as set forth in Claim 1 wherein the engine function is a hydraulic control pressure associated with a fuel system of the engine.

7. A control system for closed-loop control of an engine function that is appropriate for fault monitoring in an internal combustion engine, the control system comprising:

- a data source providing a desired data value for the function;
- a data source providing an actual data value for the function;
- an input data value derived from the desired and actual data values for the function;

- a fault monitoring system for monitoring the input data value over a time interval comprising a timing function defining the time interval, an integration function that integrates the absolute value of the input data value during the time interval to provide an integrated data value, and a comparison function for comparing the integrated data value and a data value defining a fault.

8. A control system as set forth in Claim 7 wherein the fault monitoring system further comprises a latch function that operates to

latched condition when the result of comparing the integrated data value and a data value defining a fault indicates that the integrated data value is greater than or equal to the data value defining a fault.

9. A control system as set forth in Claim 8 wherein the data value defining a fault is a programmable parameter in the control system.

10. A control system as set forth in Claim 7 wherein the fault monitoring system further comprises a reset function for resetting the fault monitoring system upon expiration of the time interval.

11. A control system as set forth in Claim 7 wherein the time interval is a programmable parameter in the control system.

12. A control system as set forth in Claim 7 wherein the data source providing a desired data value for the function provides desired hydraulic control pressure data and the data source providing an actual data value for the function provides actual hydraulic control pressure data.

13. A method for fault monitoring in an internal combustion engine control system that provides closed-loop control of an engine function, the method comprising:

processing a desired data value for the function and an actual data value for the function to develop values of error data for the closed-loop control of the function;

monitoring the input error data values over a time interval defined by a timing function by integrating the absolute values of the error data values during the time interval to provide an integrated data value, and comparing the integrated data value and a data value defining a fault.

14. A method as set forth in Claim 13 further comprising operating a latch function to latched condition when the comparison of the integrated data value and a data value defining a fault indicates that the integrated data value is greater than or equal to the data value defining a fault.

15. A method as set forth in Claim 14 further comprising programming into the control system a desired data value for the data value defining a fault.

16. A method as set forth in Claim 13 further comprising resetting the fault monitoring system upon expiration of the time interval.

17. A method as set forth in Claim 13 further comprising programming into the control system a desired data value for the time interval.

18. A method as set forth in Claim 13 further comprising providing a data value for desired hydraulic control pressure as the desired data value for the function and providing a data value for actual hydraulic control pressure as the actual data value for the function.